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Dissertation on alimentary substances

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Alimentary Substances,

by

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Of Alimentary Substances.

It may be considered as a general rule, that organized beings adopt, as aliments, substances lower than themselves in the scale of organization; or which, if not originally lower, in some measure become so by certain spontaneous changes they undergo. There are of course many exceptions to this rule; but viewing the whole of animated beings it seems to be a law of nature. Thus plants, and perhaps the very lowest kinds of animals, have the power of assimilating carbonic acid gas: the powers of assimilation of plants and of such animals may also extend to other inorganic compounds of carbon — indeed they seem to derive their chief nourishment from matters of that nature.

Higher in the zoological scale we find that animals almost invariably prey on those inferior to themselves either in magnitude, organization or in intelligence, till we arrive at man himself. He, as his necessities or his pleasure may dictate - appropriates every nourishing substance - even carbonic acid gas; which his stomach, perhaps in common with that of other animals seems able to assimilate. Of course a lion ~~as~~ ~~well as~~ or even a crab, can feed on the body of man, as well as on that of an ox or of an insect. But no one we presume, will assert that man is the natural prey or food of these animals; & this alone is the immunity for which we contend; since in all nature's operations we are to bear in mind not the exception, but the rule; otherwise we shall be constantly liable to error.

By this beautiful arrangement

in the mode of their nutrition, the more perfect animals seem to be relieved of the toil of the primary assimilation of the materials composing their frame; as in their food, the elements are already in the order which is best adapted for their purpose. Hence the assimilating organs do not require that complication, which they would otherwise have needed, and much complicated machinery is thus saved. Striking illustrations of this abridgement of organization are afforded by the differences above mentioned, between the assimilating apparatus of carnivorous & of granivorous animals. According to the scale which this disparity exhibits, we can form some idea of the complication which would be requisite, if such an animal as man were, like a plant, destined to feed on carbonic acid gas, or carburetted hydrogen, or any

other simple compound of carbon.

Another great purpose is effected by this order of things, without which, organization, at least, as at present constituted could hardly exist. If organized beings did not prey on each other, their remains would, in time, accumulate in such quantity, as to be nearly incompatible with life, certainly with animal life in the most perfect condition.

But since animals are food for each other, not only is opportunity afforded, for the existence of a greater number of animals, & of a greater variety of them; but the obtrusion of the bodies of those in whom life has become extinct, is entirely prevented. Many other important results are obtained, but it would interfere with our design to enter upon their consideration; there is however, one consequence of this system of universal voracity, which more immediately concerns us, since it suggests a natural classifi-

cation

of alimentary substances; we allude to the similarity of composition which exists among the principles or elements constituting the fabric of organized beings.

It can be demonstrated that organized matters, however apparently dissimilar, yet chemically speaking, are often nearly related, & as an example of this relation we may take the composition of the extensive class of substances, denominated the "Saccharine" group, all which, notwithstanding the endless diversity of their appearance are essentially alike - in that they consist of carbon associated with water.

Saccharine substances are chiefly found in the vegetable kingdom, of which they form the characteristic "staminal principle."

Another well known class of bodies, existing both in vegetables & in animals are those, whose character is oily. "Oleaginous" bodies occur in an infinite variety of forms, some being solid, others fluid; yet in all,

their peculiar properties are so strongly marked, that we seldom hesitate about their nature. On this distinctness of outward appearance, oily bodies are strongly contrasted with the saccharine group, before mentioned; many of which have few apparent & sensible qualities in common. The composition of all bodies of this oleaginous group, which we have ~~hitherto~~ spoken of, has been found by examination to be essentially the same; they are either composed of olefiant gas & water, or have a reference to that composition. Such is also the composition of the well known "principle principle" termed "spirit of wine" or alcohol; into which, most substances of the saccharine group, under certain circumstances are readily convertible by the process of fermentation.

When almost any part of the animal body, (with the exception perhaps of those con-

stituents which are purely of an Albuminous character) is boiled in water, it is separated into two portions - one soluble in water, & forming with it the substance called Gelatine - the other remaining insoluble, indeed becoming harder. the longer it is boiled; and which from the identity of its properties to those of the white of an egg is termed albumen.

These animal principles exist in very different proportions in the different textures; some of these textures, as the skin, being entirely convertible into gelatine; while others yield comparatively little gelatine & consist principally of albumen.

Gelatine does not exist as a fluid in any animal compound; whence it has been supposed to be produced by boiling - but perhaps without sufficient grounds. One of the most remarkable properties of Gelatine, is its ready convertibility into a sort of sugar

by a process similar to that by which starch may be ~~obtained~~ so converted. Gelatine may be considered as the least perfect kind of albuminous matter existing in animal bodies; intermediate between the saccharine principle of plants, and thoroughly developed albumen; indeed, as it exists in animals, it might be considered the counterpart of the saccharine element in plants. Albumen exists as a fluid in the blood, and small quantities of fluid-albumen are also contained in certain animal secretions; but there is much more of it as a solid - forming what is called coagulated - albumen.

The blood also contains Fibrin - another modification of the albuminous principle in a fluid ~~state~~ or at least in a suspended state; though the most frequent condition of Fibrin, is that of a tough - fibrous mass; in which condition, together with albumen, it forms the basis of the

muscular or fleshy parts of animals.

The curd of milk is also a modification of the albuminous principle. Another is the substance called gluten, which, tho' most abundant in vegetables, so far resembles the fleshy parts of animals, as to be in like manner separable into two portions analogous to gelatine & albumen. Neither of these modifications of albumen have yet been found convertible into sugar. But all of them - including gelatine - differ from the oleaginous & saccharine ~~group~~ principles in that they contain a fourth elementary principle, namely, azote or nitrogen.

Such are the three great "staminal principles", as they are called, from which all organized bodies are essentially constituted. These, without changing essential composition are capable of assuming an infinite variety of modified forms; many of which are so peculiar, that it is difficult to recognize

them by their sensible properties.

Moreover, these are, in their forms, capable of readily passing into one another, and of combining with each other; at least the organic agents, have the power of effecting these changes. Further, these principles are all susceptible of change into new principles, according to certain laws; thus the saccharine principle is readily convertible into the acid called oxalic; or under other circumstances, into that modification of the oleaginous principle, called, alcohol. Though an endless variety, however, of these modifications exist in different organized beings, accompanied by numerous foreign bodies, the proportion which they bear to the Staminal principles themselves, is very limited; and they are either confined to glandular secretions, or are excrementitious; that is to say, they form no part of the living body, tho' they are attached to it; as in the case of the various products of secretion — the shells

of the mycoscous tribes, and many others.

The consequence, then, to which we have before alluded is; that as all the more perfect organized beings - feed on other organized beings, their food must necessarily consist of one or more of the above three principles.

Hence it not only follows, that in the more perfect animals, all the antecedent labor of preparing these compounds "de novo" is avoided; but that a diet to be complete must contain more or less of all the three principles. Such, at least, must be the diet of the higher classes of animals, & especially of man. It can not be doubted, that many animals have the power of forming chyle, and if expressly organized for this purpose, may even live, for a time, on one of these classes of aliments; but that they can be so nourished for an unlimited period, is exceedingly improbable.

May, judging from observation - and the results of late physiological research,

we are led to quite an opposite conclusion; namely that the more perfect animals could not exist, and that a mixture of two, at least, of the staminal principles is necessary, to form an aliment well adapted to their use.

This view of the nature of aliments is well illustrated & maintained in the instance of the composition of Milk, which seems to be designed and prepared by nature expressly as food; and it is the only material, throughout all organization, which is so prepared.

We should expect therefore to find it a model - a kind of prototype, so to speak, of nutritious materials in general. Now all milk has been found to contain a saccharine principle - an oily principle, and a caseous or strictly speaking, an albuminous principle, though these may be combined in different proportions in the different kinds of milk.

No one can for a moment deny the object for which this valuable fluid

was prepared. No one will maintain that the apparatus for its secretion arose from the wishes or wants of the animal possessing it, or from any fanciful plastic energy. On the contrary the rudiments of such an apparatus, must have existed in the body long before the animal could have felt either wants or desires. In short, it is manifest that the apparatus & its uses, were designed & made, what they are by the great Creator of the universe; and on no other supposition can their existence be explained.

The composition of the substances, by which animals are usually nourished, favors the simplicity of these primary principles of aliment. Thus, most of the granivorous & herbaceous matters contain the saccharine & the albuminous principles; while every part of an animal contains at least albumen & oil. Perhaps, therefore it is impossible to name a substance constituting the food of the more perfect animals, which is not essentially a compound of the

least two, if not of all the primary principles of aliment. But it is in the artificial food of man, that we see this great principle of mixture most strongly exemplified. We dissatisfied with the spontaneous productions of nature - culls from every source; and by reason & by instinct, forms in every possible manner & under every disguise the same great alimentary compound. This, after all his cooking & his art, is the sole object of his labor - and the nearer his results approach this object, the more nearly do they approach perfection. Even in the ~~ultimate~~ refinements of his ~~delicacy~~ luxury, & in his choicest delicacies, the same great principle is attended to; and his sugar & flour, his eggs & butter, in all their forms & combinations are nothing more or less, than disguised imitations ~~than~~ of the great alimentary prototype Milk - as furnished him by Nature.

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